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ADMIN RECORD

SAMPLING AND ANALYSIS PLAN FOR THE WASTE CHARACTERIZATION OF TANK #4, IHSS 129

Prepared for:

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PRE-JOB SAMPLING AND ANALYSIS PLAN
FOR THE WASTE CHARACTERIZATION OF THE BUILDING 443
UNDERGROUND FUEL OIL TANKS

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Acronyms

BGS	Below Ground Surface
COC	Chain of Custody
EMD	Environmental Management Division
ERM	Environmental Restoration Management
FO	Field Operations
QA/QC	Quality Assurance/Quality Control
RCRA	Resource Conservation and Recovery Act
RFEDS	Rocky Flats Environmental Database System
RMRS	Rocky Mountain Remediation Services
RPD	Relative Percent Difference
SVOC	Semi-Volatile Organic Compound
TOC	Total Organic Carbon
TPH	Total Petroleum Hydrocarbons
TSCA	Toxic Substances Control Act
UTS	Universal Treatment Standards
VOA	Volatile Organic Analysis
VOC	Volatile Organic Compound

1.0 INTRODUCTION

This sampling and analysis plan supports the IHSS 129 Source Removal Project. This project includes removal of chlorinated solvent-contaminated No. 6 fuel oil from an underground storage tank near Building 443. Historical site and analytical information is from the Final Historical Release Report for the Rocky Flats Plant, DOE, 1992 and Closure Plan Building 443 No. 4 Fuel Oil Tank, Rockwell, 1988.

This sampling effort will be done to determine the levels of semi-volatile organic compounds (SVOCs), volatile organics (VOCs), metals, radionuclides, total organic carbon (TOC), and total petroleum hydrocarbons (TPHs) in the water phase present in Tank #4, and VOCs, SVOCs and metals in the rinsate. These sampling results are necessary for acceptance to the Building 891 Water Treatment Facility, and to determine the end state of the tank.

The objective of this Sampling and Analysis Plan is to describe the data required to characterize the water and all associated sampling, quality assurance/quality control (QA/QC) requirements, and data handling procedures.

2.0 SITE DESCRIPTION

IHSS 129, Building 443 #4 Fuel Oil Tank, was one of four tanks used to supply No. 6 fuel oil to the Building 443 steam plant boilers. The tanks are oriented longitudinally in an east-west direction, approximately 16 feet due east of the building. The tanks are constructed of carbon steel and are approximately 11 feet in diameter, 27 feet long with a total storage capacity of approximately 20,000 gallons each. The tops of the tanks are approximately 2 to 4 feet below ground surface (BGS).

Four steel supply and return lines attach each of the four tanks to Building 443. The four lines from each tank run in a concrete pipe chase and include: a steam line to supply the heaters located inside each tank, a return condensation line from the heaters, a pump line to pump fuel oil to Building 443, and a return line for oil being circulated from the Building 443 boilers. An additional aboveground line connects two supply tanks south of Building 551 to the four tanks.

3.0 HISTORICAL RELEASES

Tank #4 was used between 1967 and 1984 primarily to store No. 6 fuel oil. However, during the 1970s, Tank #4 was also used to store approximately 18,500 gallons of No. 2 diesel oil. From 1984 to 1986, Tank #4 was used to store a mixture of water and compressor oil and from 1967 to 1986, as many as 520 gallons of solvents may have been placed in Tank #4. Dip-stick test results from December 11, 1995 show approximately 2-4 inches of oil on top of 18,500 gallons of water with approximately 4-6" of sludge on the bottom. Table 3-1 lists solvent levels in Tank #4 from a 1986 sampling event.

Table 3-1 Sample Results for March 7, 1986 Sampling Event

Constituent	Water-Phase Liquid (mg/L)	Oil-Phase Liquid (mg/L)
Methylene Chloride	25	140
1,1,1-Trichloroethane	40	17,000
Trichlorofluoromethane	17	<5

In 1970, a 1,500 gallon sulfuric acid spill occurred in the vicinity of the tanks. A sodium hydroxide spill of approximately 1,000 gallons also occurred in this area. Because of the concentration and volume of acid spilled, the vicinity of the spill sites to the tanks, and the discovery of No. 6 fuel oil in a nearby posthole, it is suspected that there is a breach in Tank #4.

4.0 SAMPLING ACTIVITY DESCRIPTION AND RELATIVE PROCEDURES

The sampling will be done in three phases. The first phase will be conducted prior to the content removal. One sample will be taken from the water layer of Tank #4 and analyzed for gross alpha/beta content using a radiological screen, VOCs, metals, TOC, and SVOCs (Table 4-1).

The second phase will be conducted as the tanker trucks are filled with the water to be transported to the Building 891 Water Treatment Facility. One sample from each tanker truck will be analyzed for TPH as required for treatment at the facility.

The third phase will consist of one sample taken of the rinsate water prior to use and one sample taken after the final rinse has been completed. These samples will be analyzed for VOCs, SVOCs, and metals. The unused rinsate sample will be taken to show a background level of organics and metals in the water. The used rinsate sample will show the final state of the tank and may serve as a basis for RCRA tank closure per the RCRA Part B Permit requirements. This phase may be repeated if the levels of VOCs are detectable in the rinsate.

The samples will be collected using a stainless steel, teflon or glass bailer or coliwasa. The sampling device will be discarded or deconned after use. The samples will be packaged and preserved as outlined in Table 4-1.

Table 4-1 Sample Types and Associated Analytical Methods

	Analytical Method(s)	Analytes	Matrix	Container	Preservative	Holding Time
PHASE I (pre-job water)	Gas Proportional Counting	Rad Screen	Water (W)	125 ml HDPE jar	HNO_3, pH<2	6 months
	SW-846 8240 (totals)	VOCs	Water (W)	2-40 ml amber glass vials with Teflon-lined septum closure	HCl, pH<2	14 days until extraction, then 40 days
	SW-846 7000 Series 6000 Series	Metals	Water (W)	1-1 L HDPE bottle	HNO_3, pH<2	Hg 28 days, All others 6 months
	SW-846 8270 (totals)	SVOCs	Water (W)	2-1L amber glass jar with Teflon-lined lid	Cool, 4°C	7 days until extraction, then 40 days
	SW-846 9060	Total Organic Carbon	Water (W)	500 ml HDPE bottle	Cool, 4°C and HCl/H_2SO_4 pH<2	28 days
PHASE II (tank water)	SW-846 modified 8015	Total Petroleum Hydrocarbons	Water (W)	1L amber glass jar with Teflon-lined lid	Cool, 4°C	7 days until extraction, then 40 days

	Analytical Method(s)	Analytes	Matrix	Container	Preservative	Holding Time
PHASE III (rinsate/unused)	SW-846 8240 (totals)	VOCs	Water (W)	2-40 ml amber glass vials with Teflon-lined septum closure	Cool, 4°C HCl, pH<2	14 days until extraction, then 40 days
	SW-846 8270 (totals)	SVOCs	Water (W)	2-1L amber glass jar with Teflon-lined lid	Cool, 4°C	7 days until extraction, then 40 days
	SW-846 7000 Series 6000 Series	Metals	Water (W)	1-1 L HDPE bottle	HNO_3, pH<2	Hg 28 days, All others 6 months
PHASE III (rinsate/used)	SW-846 8240 (totals)	VOCs	Water (W)	2-40 ml amber glass vials with Teflon-lined septum closure	Cool, 4°C HCl, pH<2	14 days until extraction, then 40 days
	SW-846 8270 (totals)	SVOCs	Water (W)	2-1L amber glass jar with Teflon-lined lid	Cool, 4°C	7 days until extraction, then 40 days
	SW-846 7000 Series 6000 Series	Metals	Water (W)	1-1 L HDPE bottle	HNO_3, pH<2	Hg 28 days, All others 6 months

Samples will be collected as follows:

- Samples collected with a bailer will follow GW.06, Rev. 2, Section 5.8.1.1 Groundwater Sampling Using a Bailer, except that references to wells will be considered references to tanks or tanker trucks.

- Samples collected with a coliwasa will be collected as follows:

  - Lower the outer coliwasa tube into the liquid waste at a rate that permits the levels of the liquid inside and outside the coliwasa to remain about the same.
  - When the coliwasa hits the bottom of the tank/tanker truck, or is as deep as physically possible, lower the insdie rod or tube into the outer tube to seal the two parts.
  - Slowly withdraw the coliwasa from the waste container with one hand while wiping the

outside of the coliwasa with a Kimwipe or rag with the other. Care should be taken to minimize the agitation/aeration of the sample.

- Carefully discharge the sample into the appropriate sample container by slowly pulling the inside rod or tube up and thus breaking the seal. The process is then repeated until the sample container is full.
- Tightly cap the sample container.

- VOC samples must maintain zero headspace. Water samples taken for VOC analysis must not contain any bubbles. To ensure this, allow the vial to fill and form a meniscus at the top. Place the cap over the vial so that the teflon coated side of the septum is in contact with the sample. Tighten the cap. Invert and gently tap the vial to verify that there are no entrapped air bubbles. If air bubbles are present, dispose of the sample and vial, then select another container and resample.

- The samples will be handled in accordance with *EMD Operating Procedures Volume I Field Operations* 5-21000-OPS-FO.13, *Containerization, Preserving, Handling, and Shipping of Soil and Water Samples*. Due to time constraints during sampling, the sampling will be placed into a cooler with blue ice (if required) and transferred to the laboratory or subcontractor refrigerator as soon as possible to chill the samples to 4°C ± 2°C. It is recognized the cooler and samples will not achieve 4°C ± 2°C in the field, and the temperature will not be monitored. This will prevent opening the cooler multiple times and causing it to rise in temperature. All VOC bottles will be bagged prior to shipment as specified in FO.13. All other sample bottles will be bagged either in the field or subcontractor trailer, or the samples may be delivered to the on-site laboratory without bags.

- Sample documentation will follow *ERM* 5-21000-OPS-FO.14, *Field Data Management*, as appropriate, including all requirements for RFEDs documentation and COCs. Computers will be backed up on a monthly basis.

- If the equipment is not disposable, it will be deconned with a triple rinse, followed by a wipe down with the degreasing solution used to decontaminate the tank (HEP-1). All decon water will be included in the tanker truck and treated at the Building 891 Water Treatment Facility. All equipment field decontamination activities will be documented in the decon logbook.

5.0 DATA QUALITY OBJECTIVES/QUALITY ASSURANCE

The water samples taken prior to the content removal will be for acceptance to the Building 891 Water Treatment Facility. There are no specific levels the water has to meet to be accepted, but the levels of SVOCs, VOCs, metals, total organic carbon and radionuclides, must be known to tailor the treatment to the contaminants. The water samples taken during removal (second phase) are required for the same reason.

The rinsate samples will be taken to show the level of organics and metals remaining in the tank after the contents are removed. (See Figure 5-1)

The sample results will be compared to the clean closure standards for rinsate from decontamination of secondary containment areas, as outlined in the RCRA Part B Permit, Section VIII, Closure of Permitted Units, 5. b. Closure Performance Standard. Specifically, the rinsate must meet non detectable levels of organic hazardous constituents, and the levels of metals in the rinsate must be at or below the background levels in the unused rinsate solution.

If the results meet the closure performance standards, the tank will be ready for foaming.

If the results do not meet the closure performance standards and it appears (engineering judgement) that the contaminants are remnants of the initial tank contaminants, the tank will be triple rinsed again with high pressure steam. Organic and metals samples will be taken again at this time. However, if these results do not meet the closure performance standards, no further rinsing action will be taken, the tank end state will be documented, and the tank will be considered ready for foaming.

If the results do not meet the closure performance standards and it appears (engineering judgement) that the contaminants are from a source other than the original tank contaminants, (i.e., contaminated groundwater infiltration), no further rinsing action will be taken, the tank end state will be documented, and the tank will be considered ready for foaming. An absorbent may be used in the tank prior to foaming.

Duplicate samples will be taken to ensure sample quality. The first duplicate sample will be taken with the water sample prior to content removal and analyzed for SVOCs, VOCs, metals and radionuclides. Additional duplicate samples will be taken from every third tanker truck and each rinsate sample taken.

In addition, each cooler containing volatile organic samples will require a trip blank. A comparison between real and duplicate samples must meet a 200% Relative Percent Difference (RPD) for radiological samples, a 30% RPD for organic samples and a 40% RPD for metals samples. The RPD limits must be met for all samples with results greater than five times the reporting limit. A goal of ninety percent usable data will be verified after receipt of laboratory quality reports.

Figure 5-1

DQO FLOW FOR IHSS 129